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NAVAL WAR COLLEGE,
Newport, R. I.

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NAVAL WAR COLLEGE,

NEWPORT, R. I.

ABSTRACT OF THE COURSE,

1899.

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ABSTRACT

OF THE

COURSE AT THE NAVAL WAR COLLEGE, 1899.

Although the course at the Naval War College for the summer of 1899 was not of the usual character and lacked the fullness and continuity of previous courses, still sufficient work was done to justify an Abstract, as in preceding years, and its publication for the benefit of the service.

The course of the year was conducted with the attendance mainly from officers of the North Atlantic Squadron, during the stay of that squadron, under Rear-Admiral Sampson, in the harbor of Newport. The use of Newport as a rendezvous for this squadron during the past summer emphasized the value of the harbor and its approaches, it being practically shown that it is the only port upon the Atlantic coast that affords the facilities and resources of a port with an extensive anchorage for battle ships and with hydrographic conditions permitting the entrance and departure of vessels of the largest size at any stage of the tide, during day or night, and without regard to fog. To this is added an agreeable and healthy climate.

The course was opened on the 31st of May, with a comparatively large attendance, by a lecture upon Preparation for War by the President. This lecture has been printed and distributed to the service, and hence requires no summary. As the course was peculiar in its composition, from the circumstances, a formal explanation was made as follows:

EXPLANATION OF THE COURSE.

The methods employed in the regular courses, of late years, at the College have presupposed in the officers in attendance maturity of years and professional experience and knowledge. With this as a basis, the system has been the one so successfully employed in Germany, and of late years in the United States, of individual work, research, and thought. with collective discussion. As means to further this research, the library and lectures are presented.

Although this system can not be followed out entirely in a course of the nature proposed for this summer, still it will be steadily kept in view, and in the war games—or better, war situations—this method alone is employed.

The want of continuity in attendance pertaining to the situation, then, will lead to the postponement, for the present, of the general problem of 1899, which involved a study of the Lakes, the whole Atlantic and Gulf coasts, and the question of the protection of Puerto Rico; also, a postponement of individual description and criticism of the various important naval campaigns and fleet actions of the past, and the examination and study in detail of the large foreign navies of the world. It is expected, however, to give a general review of the sea power of England, Germany, France, and perhaps other Powers, in separate papers, if time permits.

The course proposed will be arranged to make each day, so far as possible, complete in itself.

The only continued series of lectures now proposed will be those of Captain Mahan on Naval Strategy. These are six in number, and were to be delivered by Captain Mahan in person during the first week in June, but his appointment as a representative of the Navy and the nation to the international conference at The Hague prevents this personal delivery, and the lectures will be read by members of the College Staff.

It is hoped that one or more lectures, treating of naval tactics in a broad and comprehensive manner, will be delivered by Captain Taylor of the *Indiana.*

Captain McCalla will deliver late in July one or two lectures upon the Naval Lessons of the War, which it is hoped will evoke a full discussion from those interested.

Several important subjects will be taken up for discussion by officers in attendance, and it is hoped that the officers of this squadron, which represents one of the two great fleets of the late war, will give us the benefit of their experience and observation so magnificently acquired in war service.

The first of these will be upon the general subject of scouting by ships. To hinge a discussion upon this question, there will be read a short paper on scouting by Lieutenant-Commander Murdock.

The second discussion will be upon Modern Naval Blockades and Investments. The discussion will be introduced by the reading of a paper upon this subject by Lieutenant-Commander Glatzel, of the German Navy, translated and read by Lieutenant Traut, of the College Staff.

The third discussion will be upon the relative sphere of mobile and fixed coast defenses. The discussion will be based upon a paper by Capt. C. F. Goodrich, of the Navy, upon the Military Elements of Coast Defense, to be read in his absence by one of the College Staff.

Printed copies of the International Law Situations for 1899 have been distributed. Written solutions are invited from officers interested in the subject, on or before the 25th of July; at a period after that date, there will be a discussion and general formulation of the solutions. At some period before the 25th of July there will be a lecture upon the international law bearing upon the subjects by the President of the College.

There are other lectures that were intended to be delivered this summer by Professor Alger, Lieutenant Rodgers, Lieutenant Bernadou, Mr. John C. Ropes, Medical Inspector Siegfried, Professor Hollis of Harvard University, Major Wallach of the Marine Corps, and a series upon international law that may be given later if time permits.

I do little more than mention the war games in this statement; they will be explained in full by Lieutenant-Commander Murdock, who is in charge of that department of the College. Of their value too much can not be said. They have been improved from year to year, and a comparison with these games and those used by other services—the "Jane" or English game, for instance—will show the greater utility and practicability of the War College games.

A course of reading, which has been recommended to officers at regular sessions, will be found posted in the library. The college building is open every day from 8 a. m. to 10 p. m., and with its library, charts, and plant in general is at the service of the officers of the fleet.

The following lectures were delivered:

Preparation for War (1)	By the President.
Explanation of the War Games (1)	By Lieutenant-Commander Murdock, U. S. N.
Naval Strategy (6)	By Captain A.T. Mahan, U. S. N. (Owing to the absence of Captain Mahan, these lectures were read by the College Staff.)
A Review of the Strategical Features of the New England Coast (1)	By Lieutenant-Commander Murdock, U. S. N.
Sea Power of England (1)	By the President.
Sea Power of France (1)	By Lieutenant-Commander Murdock, U. S. N.
Sea Power of Germany (1)	By Lieutenant Traut, U. S. N.
Naval Scouting (1)	By Lieutenant-Commander Murdock, U. S. N.
The Eastern Defenses of Long Island Sound (1)	By Major S. S. Leach, of U. S. Engineers.
What the Acquisition of the Philippines will Require of the Navy (1)	By Lieutenant Niblack, U. S. N.
Lessons of the Late War (2)	By Captain B. H. McCalla, U. S. N.
Tropical Conditions Affecting our Naval Forces (1)	By Medical Inspector C. A. Siegfried, U. S. N.
Tactics of the Ram (1)	By Lieutenant W. L. Rodgers, U. S. N.
Naval Tactics (1)	By Captain H. C. Taylor, U. S. N.
Blockades and Investments (1)	A discussion.
Operations in Charleston Harbor in 1863 (1)	A discussion.
International Law, with Especial Reference to the Situations of 1899 (1)	By the President.

Toward the end of the lecture course, the main problem of the year was taken up by several officers who were ordered in attendance and continued after the course, and the following papers were prepared and read:

History of Former Naval Operations on the Great Lakes, Lake Champlain, and the St. Lawrence (1)	By Commander R. T. Jasper, U. S. N.
History of Former Naval Operations in and about the Waters of Puerto Rico and Santo Domingo (1)	By Commander T. H. Stevens, U. S. N.
Naval Resources of the Great Lakes and the St. Lawrence (1)	By Lieutenant A. M. Cook, U. S. N.
Combined Operations (1)	By Captain Asa Walker, U. S. N.
An Account of Some Past Military and Naval Operations in Cuba and Puerto Rico (1)	By Captain C. H. Stockton, U. S. N.

Lieutenant-Commander Murdock, in his paper upon Naval Scouting, discussed a subject which is timely and important.

> Scouting [he says] is a naval essential as yet but little studied. The knowledge of the position of the enemy is the starting point of all successful operations against him. * * *
>
> The development of steam navies has so simplified the movements of fleets, while increasing their rapidity, as to render it a matter of great difficulty to locate an enemy's fleet at sea in time to admit of preparation to resist its attack. At the same time, the great mobility and reliability of steam cruisers give them vastly greater scouting efficiency than was ever known under old conditions. As fleets become practically independent of wind and weather, their movements can be simulated with accuracy, and investigations of methods of scouting and of seeking or avoiding an enemy can be worked out on a chart by parallel rulers and compass. It is not pretended that this method can teach all that can be learned, but crude or ill-digested schemes may thus be shown to be worthless, while others may give so good results as to warrant trial at sea under real service conditions. The strategic game, as developed at the War College, affords facilities for the practical investigation of problems of this nature, second only to actual fleet exercises. The latter may be impracticable from lack of proper vessels, want of time, or the ever-present "exigencies of the service," and in this event the strategic game is the best instrument in our possession.

Lieutenant-Commander Murdock goes on to discuss the so-called "curve of search," referring to various suggestions and the treatment of the subject in print by Commander Wainwright, and also the plans of scouting proposed and pursued by Vice-Admiral Kerr and Vice-

Admiral Seymour, of the British Navy, in the naval maneuvers of 1896.

> There are two distinct operations in successful scouting [the lecturer goes on to say]: one is the mere mechanical arrangement or deployment of the scouts, to work along certain lines or in a definite area. This is comparatively simple and admits of regulation by rule. The other is the correct determination of the area in which the scouting is to be done, and this is vastly more important and difficult, involving, as it does, a thorough knowledge of the circumstances affecting the enemy's movements and a consequent correct forecast of his intentions. These are the qualities which make the successful naval commander, and although they may be developed and improved by study, can never be reduced to rule or precept. Practice may make perfect in this as in other studies, and in this respect the strategic game once more appeals to us as one of the most efficient instruments for advancement in our profession. There is no better way in which practice can be obtained in fathoming the plans of an enemy.

In discussing the rôle of the scout the lecturer says:

> The question will often arise, Should a scout engage an enemy or undertake any military operations? The temptation may be great. A commanding officer may see important military advantages apparently within his grasp, and every professional instinct impels him to seize the opportunity. Even if victory were not certain, his choice would naturally be to try the chances of war, and above all to avoid the appearance of withdrawal from an enemy. Any indulgence of these very natural impulses might, however, work great disaster to his cause, as, even if victorious, he might be crippled and unable to continue his scouting, or he might find a prize on his hands requiring all of his attention.

The officers of the College having this paper under review, while agreeing thoroughly with this statement of the lecturer, are not prepared to follow him when he further suggests that, to avoid temptation, scouting vessels should be without any armament. This would render them helpless and unable to defend themselves from the attack of a torpedo boat or destroyer, or a fast, lightly armed converted steamer.

A suggestion of Lieutenant Traut, one of the permanent staff of the college, in connection with scouting, is worthy of mention here:

> Considering the possibility of the evasion in nighttime of an enemy's fleet or convoy, it is recommended that, with the knowledge of the general direction and rate of speed (necessarily slow) of the enemy's fleet, the scout would do well after nightfall to take the same general heading and rate of speed, and at daybreak resume the search at full speed, confident that the fleet or convoy has not slipped by during darkness.

The paper read by Major S. S. Leach, U. S. A., of the United States Engineer Corps, upon the Eastern Defenses of Long Island Sound, was of great interest, and the courtesy of Major Leach in presenting this paper before the officers in attendance was highly appreciated. The discussion that followed was also of interest, and made especially so by the presence of a number of officers of the Army from the neighboring posts. The harmony that prevailed in this discussion, which extended to one upon the relative scope of fixed and mobile defenses, shows that, with proper care and understanding, the sister services can work in unison and with the greatest effect. The paper of Major Leach is withheld from further notice or publication on account of its confidential nature. It is the belief of the College that a joint Board or Commission for Home and Colonial Defense, composed of officers of the Army and Navy and presided over by a Cabinet officer, would tend to great usefulness for the country and promote economy, harmony, and unity of effort.

The following summing up of the discussion upon fixed and mobile defenses is hereby given. It commenced with the following quotation from Mahan's The Influence of Sea Power upon the French Revolution and Empire, Vol. I, page 341, in which the author says:

> A wisely coordinated system of defense does not contemplate that every point is to hold out indefinitely, but only for such time as may be necessary for it to receive the support which the other parts of the whole are intended to supply. That the navy is the first line of defense, both in order and in importance, by no means implies that there is or should be no other. This forced and extravagant interpretation, for which naval officers have been largely responsible, of the true opinion that the navy is the best protection for a sea frontier, has very much to do with that faulty strategy which would tie the fleet, whatever its power, to the home ports, and disseminate it among them. Navies do not dispense with fortifications nor with armies; but when wisely handled they may save their country the strain which comes when these have to be called into play—when war, once remote, now thunders at the gates, and the sea, the mother of prosperity, is shut off. This kindly office did British seamen for Great Britain in the days of Napoleon, and mainly through those close blockades of which St. Vincent set the pattern before Toulon in the Mediterranean, and afterwards before Brest, when he took command of the Channel fleet.

A true coast defense, as differentiated from harbor defense, demands a protection of our coast from blockade and investment.

Take, for instance, the latter-day blockade of the War of 1812. The effect of this blockade became far-reaching as time went on and as it became more extensive and more rigorous. The banks of the country, excepting those of New England, suspended specie payments. Mr. Henry Adams says:

> Until the blockade should be raised and domestic produce could find a foreign market the course of exchange was fixed and specie payments could not be resumed.

The source of revenue being destroyed, the Treasury was bankrupt and the interest on the national obligations could not be paid. As to the taxes necessary to carry on the war, Jefferson wrote:

> The taxes proposed can not be paid. How can people who can not get fifty cents for a bushel of their wheat, while they pay twelve dollars for their salt, pay five times the amount of taxes they ever paid before?

Most of the vessels of our navy at the beginning of 1814 were either blockaded in port or had been captured or destroyed. The Americans had been excluded from the fisheries on the Banks during the war. The effect of the blockade has been told, but concerning it a quotation will be made again from Jefferson. Writing from his Virginia plantation, just before the end of the war, he says:

> By the total annihilation in value of the produce which was to give me sustenance and independence, I shall be like Tantalus—up to the shoulders in water, yet dying of thirst. We can make, indeed, enough to eat, drink, and clothe ourselves, but nothing for our salt, iron, groceries, and taxes, which must be paid in money, For what can we raise for the market, wheat? We only give it to our horses, as we have been doing ever since harvest. Tobacco? It is not worth the pipe it is smoked in.

In the year ending September 30, 1812, the exports of the United States amounted to over $38,500,000; in the year ending September 30, 1814, this had fallen off to less than $7,000,000. For the year 1812 the imports amounted in value to about $65,000,000, falling off in 1814 to less than $11,000,000.

The revenue, almost entirely derived from custom-house duties, disappeared, and internal taxes had to be substituted to supplement the duties and the proceeds of land sales,

The strength of Great Britain was, after all, shown in her supremacy at sea, practically uncontested by us. We felt it in the most effective way it could be felt—by sea blockade. We lowered the naval prestige and tone of Great Britain by our several successful and glorious actions afloat upon lake and sea, not by the amount of losses she experienced from us of either naval or mercantile vessels, but by the humiliation and mortification she felt, which was due to the enterprise, skill, and courage shown to be characteristics of American seamen. The British themselves admitted this to be shown in the careers of our frigates, sloops of war, and privateers; but, like the English infantry—said to be the best of its kind—they were too few in number and too small in class. They were not able to meet the 74's, to raise the blockade, to defend our coasts from depredations and occupation, nor to protect our carrying trade and commerce upon the high seas. This species of coast defense, of course, pertains to the Navy, and to the Navy alone.

Lieutenant W. L. Rodgers delivered a valuable lecture upon the tactics of ramming, which was profusely illustrated by diagrams. So much of the text depends upon the diagrams that no attempt is made here to reproduce or give extracts from this interesting lecture.

The lectures of Captain McCalla upon the Lessons of the Late War awakened a widespread interest, which was not confined to the vicinity of the College.

Commencing with a description of the Spanish land defenses in Guantanamo Bay, he proceeds to describe the submarine mines. It is Captain McCalla's opinion that the failure of these mines to operate was not due to the excessive marine growth of tropical waters, but—

> To the arrangement of levers, the action of which offered too much resistance to the resultant of the blows received, permitting the horizontal pushing component of the force to be transferred to the torpedo itself, which must have been shoved aside, except in the case of the *Marblehead*. In that instance the mooring cable seemed to have been caught and cut by the propeller, and the torpedo was thus towed astern of the ship, showing at times on the surface of the water as the screw revolved.
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> * * * * * * *
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> The lessons to be learned from this experience [that of fouling earlier mines], aside from the design of the contact mine, is that all such defenses should be examined once in a fortnight, and that in searching for them drags should always be employed as well as grapnels. The fact that the mines in the upper channel were more foul than those first found is no doubt due in part to the mixture of fresh with the sea water, all such marine growths increasing more rapidly in brackish water. Two of the eighteen mines said to have been planted off Hicocal Point were not recovered by us, and as my informant was the officer who placed them we inferred that the two missing ones had sunk.
>
> The method adopted to drag for the torpedoes was most successful. Two steam launches and two whaleboats, a launch and a whaleboat side by side, the pairs connected by a rope with a chain span in the center, swept the channels, and when the drag met an obstruction the boats came together and crossed the ends of the drag. The boats were then hauled carefully up to the mine, which was brought to the surface, the cylinder containing the dry gun-cotton removed, and the mooring cable cut. Twice the drag brought up two mines together.

The precautions for the health of the marines in camp are given as follows:

That the general health of our fleet and that of the marines under Colonel Huntington continued excellent through the war is so well known that it is not necessary to refer to this good fortune, except in connection with the danger which speedily arose from the appearance of yellow fever in the army camps about Santiago and the constant communication which it was necessary to keep up between Siboney and Guantanamo Bay.

It may not be uninteresting to mention the method adopted in the *Marblehead* to preserve the health of the crew:

During hostilities the men were not allowed their hammocks, for although the guns were kept loaded and three spare shells were kept on deck for each 5-inch gun and a spare box of shells for each 6-pounder, the presence of the hammocks would have interfered with the quickest manning and service of the battery. The men had their blankets and slept on deck at night and were in the open air during the day. Some slept on the berth deck, but as the engine attached to the after ventilating blower gave out late in May, and as all the air ports were closed at night to darken the ship, the berth deck was very far from comfortable. However, the Chief Constructor quickly responded to a telegram for a new engine and the ventilating apparatus was again in working order on July 1.

As the ship had been cleared for action and the guns were at all times loaded when on the blockade, we steamed slowly with one screw, or both engines were stopped. It was, therefore, easy to arrange the engineer's force in six watches, and the petty officers and men of this division were encouraged to remain night and day, when not on watch, on the poop and forecastle under extemporized shelter, in the fresh sea breeze, and advised to sleep as much as possible. In addition, the surgeon was directed to take possession of all wines and liquors belonging to the commanding and other officers, and so far as I know not a glass of any kind of stimulants was taken by anyone unless it was administered by the medical officer. The results were most satisfactory and the health of the crew continued excellent; they lost superfluous fat, became hard, and were always, on this account, in my opinion, better prepared to fight in action, or to chase, than the crew of an enemy's ship lying at anchor for weeks in a harbor, subject to the enervating influences of contact with shore. But this fact that a ship of war which kept the sea in all weather was far superior in every respect to one blockaded in port had been so clearly demonstrated by the successes of the English, during the last two and one-half centuries, over the French, Dutch, and Spanish fleets, that I should not have referred to the subject had not a naval officer several years ago, in a course of lectures at the War College, claimed that the steam fleet which lay at anchor in a harbor would be better fitted for battle than an enemy's fleet cruising outside at sea.

The short pursuit and the fighting on the 3d of July showed conclusively that this war principle had not changed and that what had always proved true during the sail period had not been at all modified by the introduction of steam.

There was but one death on the *Marblehead* from disease. This was a case of dysentery, late in August. The patient, an excellent lad of good habits, had diarrhea for three days before going to the surgeon.

The marines, on landing, established a camp on the sandy plain which extended from the north side of the bluff into the bay for a quarter of a mile to the eastward, the western extremity of which is known as Fisherman's Point. This site, which was partially covered by trees and bushes, had formerly been occupied by a village in which the pilots of the port and a small Spanish military force lived. On recommendation of the surgeon of the *Marblehead*, and of Colonel Vieta, of the Cuban army, who was also an accomplished physician, the houses and outbuildings of this village were all burned by my order on the day the marine battalion landed, as a precaution against yellow fever. I also remembered that while serving in the *Powhatan*, in the summer of 1880, we had entered the bay of Guantanamo and found a Spanish frigate lying close inside Fisherman's Point, the officers and crew of which were dying of this scourge of the tropics, and I concluded that fire would be the most perfect disinfectant.

The Spanish officials did not approve of this sanitary precaution, pointing out to Lieutenant Anderson, who went to Caimanera under a flag of truce, that the houses on the Point were owned by poor people; but the security of our force from disease outweighed, of course, all feeling of sympathy for the unfortunate owners of the buildings and their contents.

The marines also intrenched the position on the hill above the camp, formerly occupied by a Spanish blockhouse, and the commanding officer of the marines did me the honor to call it Camp McCalla. The battalion was divided between a lower and an upper camp, the former being used for the supplies. Water for cooking and drinking was supplied from the *Resolute* or from one of the other ships near at hand. The men could wash themselves and their clothes in the bay, the depth of water averaging 7 and 8 fathoms within a few yards of the beach. As there was always abundance of distilled water for legitimate purposes and enough salt-water soap, there would have been no excuse for disease from want of cleanliness. While there were indications that water might be found not far from the surface, there were no wells or running streams near this camp, the only well being located in an abandoned cattle ranch of Cuzco, on the sea front, about 2 miles in a direct line from the marine battalion, and which furnished water to the Spanish troops and guerrillas for a time in that vicinity. The soil was dry and sandy, but very little rain fell, and as the tents, after a few days, were fitted with board floors, the battalion of marines was in excellent health at all times.

It is a fact for congratulation that the sick list of the battalion averaged but 2½ per cent, while there was but about 3 per cent of sickness in the fleet, the confinement below deck, no doubt, accounting for the slight increase among the seamen.

On the arrival of the Cuban troops in Guantanamo Bay, they at once built huts with branches of palms for protection against rain and sun, and, sleeping in grass hammocks, suffered only from the change in food. But this was a serious matter. At one time 40 per cent of the Cubans were sick, suffering from diseases of the stomach and intestines, due entirely, the surgeon informed me, to change of food and overeating. This excess was natural in starved troops, and I blamed myself for authorizing the issue of full naval rations to them. They should have been given for the meat ration, as compensation, an additional quantity of rice and beans, and with bread, butter, and coffee, their health would not have suffered. I adopted this course afterwards in sending food to the Cuban troops and families inland, except that among the supplies from the Red Cross a quantity of jerked beef was issued, a commodity largely used in Cuba.

In discussing the question of an avoidance of discovery by scouts, the College feels that it does well to call attention to what Captain McCalla says as to the refuse from our ships in Cuban waters:

In war it is, of course, most important that all traces of the movements of a fleet or of single ships should be concealed. The ocean is often called trackless, but as the frontiersman tracks his foe by broken twigs, fragments of dress, or remnants from a camp fire, so it will be easy for an enemy to follow our fleets and cruisers or to note their movements from the enormous quantity of food wasted daily and thrown overboard, or by means of broken boxes, empty tins, or condemned supplies, straw, excelsior, and the variety of refuse floating in the wake of our ships. This was most marked, from my observation, during the Spanish War, and although the commander-in-chief directed that tins should be punctured before being thrown into the sea and that care should be taken to prevent other objects from drifting astern, the order was not thoroughly executed in all the ships, and two incidents impressed upon me the necessity of adopting with certainty adequate precautions in future and of inflicting severe punishment upon those who failed to obey the instructions implicitly. I refer to the fact that one night, while coaling at sea west of Santiago, a large number of oil tins were emptied on the *Texas*, also coaling from the same collier, and thrown overboard without having holes punched in them. This was done without my having been able to note what was going on, and, perhaps an hour or two later, as the moon emerged from behind a cloud, I saw it shining on what appeared to me to be a series of waves rippling on a shoal and quite near by. I at once rang for full speed astern, but was reassured by the captain of the *Texas*, who heard my orders or who became aware of my anxiety, for the sudden effect of the moonlight on a large number of floating 5-gallon tins was startling.

Another disadvantage of this wasteful habit came to my knowledge after the surrender of the Spanish forces at Guantanamo, when I heard that the most popular duty among the Spanish soldiers was to be stationed at an outpost quite near to the north shore of Guantanamo Bay, from which at night, during our occupation, they could forage for and feed from the food thrown from our ships at anchor in that bay, and which was left on the beach by the action of the wind and tide. The remedy is simple, for only the contents of the water-closets should be permitted to go overboard without careful inspection. By using manila paper, now authorized for the closets, and by having all bottles broken and empty tins punctured in the presence of a commissioned officer, every trace of the movements or whereabouts of our ships will quickly disappear, provided that all wooden boxes, heavy papers, discarded clothing, and remnants of food be burned in the furnaces.

A simple apparatus could be extemporized to separate the water from the disused soft foods and the remnants in the wash basins or tins before throwing this refuse on the fires.

Captain McCalla, under the head of The Tactics of the Fleet in the Atlantic, makes the following remarks:

There was little opportunity during the war for the application of fleet or squadron evolutions against the enemy's batteries or ships in the West Indies. Plans were prepared by the commander-in-chief for the attack of fortifications and for use against the Spanish squadron, should it be encountered in certain well-known formations.

The ship which I commanded took part in but one tactical evolution in battle, but this clearly illustrated the danger to which ships are exposed when maneuvering in a single column or "following their leader," as it is sometimes called by those naval officers who advocate the attack of a fleet in such a formation because it is simple. It certainly has that merit, but several well-known naval tacticians have pointed out that it also has the grave disadvantage of subjecting the column with the narrowest possible front to the danger of being beaten in detail. And there is no better example of its inherent weakness than the fate which overwhelmed Cervera. In my opinion, the formation of a squadron or fleet in a column of single ships is only permissible when the channel is too narrow to allow the ships to steam on a broader front. And the defect of the naval-war game, as I have seen it played at the War College, is that the practice in the past in this game has been to cause, I believe, the majority of naval officers not only to recognize the single or double column to be battle formations, but to rely upon them in maneuvering for or delivering an attack. Such practice will, I fear, if followed in war, lead to defeat. At all events, the continuance of it in the war game prevents the application of tactical principles recognized by military men to be sound and applied by them in maneuvering the units of the army, and causes us to rest satisfied at the War College with a few maneuvers, on the ground that upon the sea, which is, after all, but a vast plain without inequalities of surface, the fewest and the simplest movements are all that are required.

In regard to the matter contained in these last paragraphs the College makes the following comment:

The general principle governing the tactics of a military force, afloat or ashore, when in the presence of a similar force of the enemy, is for it to maintain itself on a line perpendicular to the direction of the enemy. In the case of a land force, the individuals having formed on this line, face the enemy to deliver their most effective fire. In the case of a fleet which has arrived on that line, the individual ships turn their broadsides to the enemy for the same reason, and thus are, though parallel to the enemy's line, in a column of vessels. This fact seems to establish the column formation as a fundamental one for battle.

Any movement to the right or left by military forces (armies or fleets), either upon the flank of the enemy or for other purposes—and these are the movements most used in battle—must be made by the subdivisions employed in marching by the flank on shore, or in column of vessels afloat.

Captain McCalla's meaning is not quite clear. If he means that, in a general way, our force should not maintain an elongated formation whose axis is in the direction of the enemy, but that it should deploy so that its line should be parallel to the front of the enemy, that general principle is admissible when circumstances permit. But this line once established, its broadside and maximum line of fire must be turned sooner or later to the enemy, with its consequent column formation.

Some modifications of land tactics must necessarily be admitted in considering naval tactics preliminary to action, a most important one being that the head or heads of columns of fleets are not so vulnerable as those of an army. The withering fire upon the heads of the Austrian columns of infantry at Marengo was overwhelming, but a fire equally concentrated upon the British columns of vessels at Trafalgar did not have the same effect. In other words, a formation whose axis is perpendicular to the front of the enemy is not so fatal for a fleet as for an army.

The citation of the destruction of Cervera's squadron as a case in point does not seem to be pertinent. This action, if carefully analyzed, presents conditions in which individual ships open attack on a greatly superior force, all being well within the zone of fire. The narrowness of the exit from Santiago required that the Spanish ships should reach the open one by one, and the intricacies were such that close distances could not be kept. Each ship, in its turn, entered the area of fire at long distance from its next astern, and destruction was a foregone conclusion, unless they had superior speed. Had the United States fleet been so disposed that it could not have fired effectively until all of the Spanish ships had reached the open, it would not, we think, have been any worse for the Spaniards. The formation taken, however, was a forced one, and we think no inference can be drawn as to results, had any other been *possible.*

If a fleet in column charges perpendicularly to an enemy's line at its center, the contention that its leading vessels will unduly suffer is admitted. Such tactics, however, do not militate against the column formation, but rather against the wisdom of the commander. At the Battle of the Yalu the attacking column charged at an oblique angle on an enemy persistently held in line, with the result that one flank of the line was overwhelmed. Each vessel in the charging squadron was able to use its most effective gunfire. At the Battle of Manila Bay, *column* was again the formation in attack, heading at first for one extreme flank of the enemy, then turning in succession through 90° and bringing the heaviest batteries of the squadron into play.

If, as the lecture states, the majority of naval officers, graduates or in attendance at the College, recognize the single or double column to be battle formations, and rely upon them in maneuvering for or delivering an attack, this recognition and reliance arise from their own experience in the battle games after many trials. The College has never formulated or urged any particular formation, but has encouraged the officers, in working the problems, to originate and carry out individual schemes.

The College is not prepared to say dogmatically what should be the formation chosen for a fleet in battle, but believes that all the experience of the past goes to indicate that *column* formation or some combination or modification of *columns* is now favored in navies, and is most likely to be used in war.

In the paper of Lieutenant-Commander Glatzel, of the German Navy, translated by Lieutenant Traut, of the War College Staff, and presented as a subject for discussion, the following extract may be given as worthy of notice and as pertinent to the conditions presented by the main problem of the year; that is, the operations of blockaded and blockading forces that would be proper and probable:

> The tactical duty of the blockaded force will consist, in general, in taking advantage of favorable opportunities for offensive operations against the blockading fleet, so that by being gradually weakened, it may be forced to abandon the blockade. In some cases, depending upon strategic conditions, it will be the object of the blockaded fleet to escape unobserved (for instance, to effect a junction with other forces).
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> In the first-mentioned case, the attacks of the blockaded fleet will be directed principally against the main body of the blockading fleet, because with the reduction of the latter the chances of success in a decisive battle are increased. Frequent torpedo-boat attacks will be the means for attaining this object.
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> But if it is intended merely to effect the escape of the blockaded fleet, intact, if possible, beyond reach of the blockading force, the tactics of the blockaded fleet will consist in effecting a passage past the pickets unobserved. The pickets will

either be driven off shortly before the escape or will have their attention distracted by feints at another point of the line.

To send the large ships to run the blockade, either separately, successively, or simultaneously, at several points, would multiply the chances of discovery, and is, therefore, not a probable maneuver of the blockaded fleet, the more since the assembling of the ships after the escape is not assured.

So, aside from the case of a feint on the picket line, it will always be the object of the blockaded force to pass unobserved through the line of outposts, whether it be with torpedo-boats for the purpose of inflicting injury upon the enemy's main body or whether it be with his own main body. The operations of the blockaded force will thus be aided, even for the purpose of the feigned attack, by taking advantage of night-time, thick weather, fog, protection against discovery by a land background; by taking into consideration the moonlight, since in this case it will be the object to deceive the pickets as to the number of ships and the strength of the attack, at another time effecting at another point the unobserved escape of the fleet. It is essential to the successful carrying out of all undertakings for the blockaded force, as the weaker party, to be constantly informed concerning the enemy's condition, in order to be able to choose a favorable time and place for attacking, by reason of which coast signal stations and the homing pigeon, balloon, reconnaissance, and intelligence services are organizations of the greatest importance to the blockaded party. The measures for the immediate protection of the blockaded fleet while lying at anchor will consist of the usual mines and obstructions laid out under the protection of fortifications. Observation of the same will be carried on by picket-boats and by search-light illumination, either from on board ship or from the shore.

It will necessarily be a rule of primary importance that the commander of the blockaded forces should make judicious use of his offensive powers—that is to say, especially his torpedo craft, but also his cruisers and even his battleships—constantly harassing the blockading fleet, so as to make the strain on its personnel and the wear and tear on its matériel as great as possible.

The blockade itself is to be looked upon as a forced tactical defensive. Even though the blockading fleet is, of itself, superior in strength to the blockaded fleet, it is still not strong enough to warrant an attack upon the enemy lying under the protection of his land fortifications. Yet it will always be the purpose of the blockading force to beat and destroy the enemy's fleet, since the very existence of the latter is sufficient to prevent any secondary action on the part of the otherwise victorious adversary. According to the principle that even the strictest defensive should be accompanied by efforts to make offensive attacks at every favorable opportunity, it will appear that the blockading fleet should not confine itself to waiting for operations by the blockaded force and opposing them when they occur, but should keep in mind the harassing and weakening of the blockaded force by torpedo attacks, and furthermore, in every case of the appearance of portions of the blockaded fleet, endeavor to accomplish not only their defeat but their total destruction. Vessels which are not destroyed, but, though badly damaged, are able to withdraw into the blockaded harbor, will, through the facilities for repair at the disposal of the blockaded force, soon be in condition for service again.

In order to render it difficult for the blockaded fleet to keep in touch with the blockader, offensive operations against outlying coast signal stations, with a view to their capture and ultimate destruction, will be found useful.

A discussion upon the operations in Charleston Harbor in 1863 was held at the College, being prefaced by the reading of a short summary of the operations of the period referred to.

The discussion was participated in by members of the permanent Staff of the College and by Rear-Admiral Luce, Captain J. R. Bartlett, U. S. N., Major Lockwood, U. S. A., Major T. K. Gibbs, late U. S. A., and Captain C. D. Sigsbee, U. S. N.

The consensus of opinion was that the capture of Fort Sumter at that time, with the fire of the Confederate batteries being duly considered, was impracticable, on account of the slow speed and consequent want of control of the monitors, the great rapidity of the tidal current, and the shoals, obstructions, and other difficulties of navigation. The monitors were very much discredited by the first attack as to their offensive and defensive powers, so that Ericsson himself stated that they could not take the forts alone. Judging from the correspondence between the then Secretary of the Navy and Admiral Du Pont, it was, however, expected that the Navy alone could take the forts and Charleston, but this seemed to be at all times impracticable. The military force furnished was also, from its lack of strength and other reasons, unable to capture the city.

The late Medical Inspector C. A. Siegfried delivered a practical and valuable lecture—the summary of which follows—upon the subject of Tropical Diseases:

In view of the past year's events and the presence of the fleet in tropical climates, attention can first be drawn to the statistics and favorable health returns, and to the instances where good results followed the avoidance of hygienic errors connected with food and water supplies, shore influences, and heat and sun effects.

The types of the common disorders and diseases imminent at all times in the tropics, to crews and military forces composed of men bred in temperate climates, were stated, such as skin and intestinal disorders; the causes, reactions, and sequences of disordered functions, such as chilling of the skin, indigestion, and the effects of the sun and radiant heat; diarrhea, dysentery, malaria, parasitism (internal and external), and infection of any specific kind, such as cholera, yellow fever, bubonic plague, and beri-beri,—the latter an intoxication rather than an infection—combined with hardship and improper dieting on tropical and semi-tropical coasts.

The value was shown of unceasing inspections, by commanding and responsible officers, of the compartments of the ship, the food supplies, the clothing, and the personnel, and the good effect of light, air, and dryness, these being the great enemies of dirt and disease, in the tropics more than elsewhere.

Appropriate recreation was stated to be a very important health element, and suitable bathing to be practised at one or two daily periods.

Excessive warmth, moisture, and filth accumulations are to be avoided and corrected. These are more or less inseparable from all tropical countries, and implacably combine to lower human resistance to disease causes and to promote germ growth. All acute and infectious diseases—really all epidemic and malignant diseases—are due to germs or specific micro-organisms, while the usual tropical conditions, as we find them, propagate and combine in existence these elements—"endemic influences." Hence the importance and absolute necessity of the study of hygiene in all its details, in order to assure our success in tropical seas with the least loss of men and materials.

The same elements that propagate the causes of disease in the tropics so commonly, also promote the growth of the decompositions and deteriorations in food stuffs, water supplies, and the fabrics of clothing and materials. Rapid change of form is characteristic of the tropics. There is also a mental and physical, or muscular, indolence, and a progressive loss of energy among the men of the white races transplanted to the tropics, which must be comprehended and acted upon intelligently, to obtain the best results therein.

In making the above extract, it is impossible to refrain from adding a few words of tribute to the zeal, ability, professional knowledge, and unselfishness of Medical Inspector Siegfried, who, for many years, was connected with the College as lecturer and attending physician. This loss is one felt in so many ways to the College that its recent occurrence prevents at the present time a full expression of its greatness and scope.

The following was the main problem of the year:

June 1.—War is imminent between Red and Blue. Information is received of the assembling of Red gunboats and torpedo vessels at Quebec.

June 5.—Large Red squadron convoying 30,000 men in 75 transports leaves Portsmouth, England; destination unknown.

Orders given to rendezvous Blue fleet at New York; four heavy monitors and a ram assemble at Boston.

June 15.—Red fleet arrives at Halifax.

Monitors assemble at Boston; Blue fleet ready at New York.

June 16.—War is declared against Blue by Black; an alliance having been formed between Black and Red; Black has 100,000 men at Kiel, with transports and a mobilized naval force ready to sail in company.

The fleets are as follows:

Red and Black fleets.	Halifax.	Quebec.	Kiel.
Battle ships	16	....	4
Armored cruisers	10	....	....
Cruisers	20	....	2
Gunboats	6	40	....
Torpedo destroyers	10	10	....
Torpedo-boats	30	10	....
Troops	30,000	5,000	100,000

Blue fleet.	New York.	
Battle ships	5	The rest of the available naval force is in the Pacific and the East Indies, and required there.
Armored cruisers	2	
Cruisers	20	The Lake force improvised and assembled from available ships and places.
Gunboats	12	
Torpedo destroyers	5	
Torpedo-boats	10	

The objectives of the Allies are the defense of the Canadian frontier; operations against the Lake cities and canals of the United States; an attack upon the Atlantic and Gulf coasts of the United States, and the capture of Puerto Rico.

The theater of the problem and the region from which supplies can be drawn is North America, east of the Rocky Mountains; the United States military force and seacoast defense those actually existing June 1, 1899.

Design a plan for meeting this demonstration. Show the best disposition of our force, and describe in detail the preparations for the campaign, taking into consideration solutions of problems of previous years.

STRATEGY.

What will be the Allied fleet's plan of campaign?

What will be its movements with reference to our force?

Where will it establish its advanced bases?

Where shall our fleet take station in order to defeat Allies' plan?

Where will be Allies' lines of communication, principal and secondary?

How can we menace these lines?

Where will our principal and secondary bases be?

Consider the method of supplying our fleet.

What places on Northern frontier should be selected as naval bases?

TACTICS.

Discuss at length tactical value of all harbors on the seacoast in the theater of operations, and determine which afford best security for an inferior fleet.

If the strategic plan involves attack upon the enemy, discuss the tactical questions of time, formation, and methods involved.

Describe in detail the tactical plans adopted for the defense of our fleet in any localities selected.

How can we best oppose the advance of the enemy up the St. Lawrence River?

What operations can be conducted against the Canadian canals?

How can the Naval force on the Northern frontier best assist the operations of the Army?

How best protect and utilize our canals and interior waterways?

COAST AND LAKE DEFENSE.

What means can be taken to defend our frontier and Lake cities?

How shall the enemy's naval force be prevented from entering Lake Michigan?

Plan the organization of the mosquito flotilla and auxiliary naval defense throughout the theater of operations, taking into consideration the ordnance supplies actually available at outbreak of hostilities.

The bases of operations of mosquito fleet being determined by strategic operations, plan their defense.

Prepare system for transmission of information throughout the Lake region.

Construct necessary war charts for defense of localities on the Northern frontier.

The solution of this problem was finally formulated at the end of the year, and is not published, being considered as confidential matter. As it was, in a measure, a review of previous problems, as well as a presentation of new matter, it was found to be most interesting.

The College found it a matter of much regret that there were not present officers of the Army to work out the operations on shore involved in the problem.

Several situations that arose in connection with the problem were worked out by means of the Strategic War Games in an interesting manner, such as the approach of the convoy, its passage across the Atlantic, and various features of the scouting involved.

It may be proper, before bringing the Abstract for the year 1899 to a close, to explain once more to the members of the naval service the objects and methods of the Naval War College.

The Naval War College was founded for the purpose of the study of the art of war, and especially the study of naval warfare in its higher sense. The Naval Academy, in its first two years, is a school for general education, especially in mathematics; for its two latter years it is mainly a school for nautical education and the study of ordnance and steam engineering, with brief courses in the naval history of the United States, naval evolutions, and international law. Throughout, it is a great school of naval discipline and practical instruction. When to the knowledge acquired at the Naval Academy is added maturity of years and judgment and professional experience to the sea officer, the time has arrived for instruction in the art of war, especially naval war, which includes naval strategy, naval tactics, the teachings of all naval history as it bears upon naval warfare, the laws and usages of war, and the tenets of international law, especially maritime international law.

It can be seen that these subjects are not extensions of courses taught at the Naval Academy, but are subjects which are treated, as a rule, for the first time at the War College, and require both experience and maturity.

There is no treatment of the use and construction of matériel, except in ships as units and finished products—units whose handling, alone or in combination, becomes a matter of study and research. These higher studies are carried on nowhere else for the Navy of the United States than at the Naval War College. To carry out these studies is required, and here obtained, a good knowledge of all other navies, and of the strategical features of the various waters and countries of the world—at home as well as abroad. As countries expand and the areas of their operations extend among the waters of the world, these studies become wider and their need more imperative, and with the demands for increased protective powers the combinations also become greater, the naval forces being larger and the interests involved more vital.

The officers in attendance upon the courses at the War College are properly those who have attained the rank of lieutenant, and should include all grades beyond that rank, until the active career of the officer in the Navy has come to a close.

The methods at present in use in the College are by means of lectures, war games, and by the workings of the main problems of the year with their consequent situations. In addition, situations or problems are worked out in international law. Aside from lectures and collective conferences upon the various subjects, these methods imply, principally, individual investigation and research, with the mental and professional qualifications in possession of the individual officer as the capital in hand.

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